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09/540,731	03/31/2000	Hans Eberle	1004-4254	1939

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EXAMINER

NGUYEN, PHUOC H

ART UNIT	PAPER NUMBER
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2143

DATE MAILED: 08/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/540,731

Applicant(s)

EBERLE ET AL.

Examiner

Phuoc H. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 May 2005 and 08 July 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7,28 and 29 is/are allowed.
- 6) ☒ Claim(s) 1-5,8-19,22-24,27 and 30-37 is/are rejected.
- 7) ☒ Claim(s) 6,20,21,25 and 26 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 07/08/05.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

1. This communication is responsive to Amendment filed 05/13/2005.
2. Claims 1-37 are pending in this application. Claims 1, 7, 18, 28, 31, and 37 are independent claims. This Office Action is made final.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-37 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re claim 1, the term "can be" or "can" in line 14 is a relative term which renders the claim indefinite. The term "can be" or "can" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably appraised of the scope of the invention. Similarly, claims 7, 18, 28, 31, and 37 have the same rejection.

Thus, claims 2-6, 8-17, 19-27, 29-30, and 32-36 are also rejected for being dependent on the rejected based claims 1, 18, 28, 31, and 37 respectively.

### ***Response to Arguments***

5. Applicant's arguments filed 05/13/2005 have been fully considered but they are not persuasive.

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The applicant argues in pages 9-11 generally for all independent claims 1, 18, 31, and 37 that the cited reference by Grant et al. fail to disclose or suggest an arbitrary logic coupled to receive an indication from a particular target node for the particular transfer as to whether the particular transfer can be supported in the particular target node as cited in the claimed invention.

The examiner respectfully submits that the current language cited in all independent claims is broadly claimed the arbitrary logic. Based on the broad interpretation, the examiner believes the cited reference still meets all the limitations cited in the independent claims, particularly the broadly claimed feature of the arbitrary logic. As clearly seen in column 10 line 59 to column 11 line 19, the arbitrary logic is the connection state controller 156 which control whether to process the request depending the condition of the originator (e.g. target) in column 11 lines 8-15.

The applicant argues in page 10 for dependent claim 4 that the cited reference by Grant et al. fail to disclose or suggest the pipeline stages having equal length in the claimed invention.

The examiner respectfully submits that cited reference by Grant et al. inherently and logically disclose in column 5 lines 55-68 that each stage of the pipeline having equal length in processing the data frame. Since the processing protocol is in synchronization mode, then each of stage of the pipeline must have at least a maximum amount of time to complete a particular longest stage. In another words, an optimum pipeline length in a synchronization mode must be equal to the maximum length of the longest stage in the pipeline.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1-5,8-16,31,32,35, and 36-37 rejected under 35 U.S.C. 102(b) as being anticipated by Grant ET. al. U.S. Patent 5,218,602.
2. Referring to claim 1, Grant reference disclose a plurality of initiator nodes coupled to send packets, into the network, and a plurality of target nodes coupled to receive packets sent into the network (Grant - Abstract); and a plurality of pipeline stages for transmitting data across the network (Grant – col. 5, lines 34-35), each pipeline stage consuming a predetermined time period, thereby providing for a predetermined time period for transmission for each packet successfully sent between one of the initiator nodes and one of the target nodes ( (Grant - Abstract; col. 5, lines 36-47; and col.. 5, lines 62-65), the pipelined stages including an arbitration stage ((Grant – service request phase) col. 5, lines 36-41), arbitration logic coupled to the initiator nodes, the pipelined network, and the target nodes, wherein for a particular transfer, the arbitration logic is couple to receive an indication from a particular target node for the particular transfer as to whether the particular transfer can be supported in the particular target node (col. 10, last paragraph through col. 11, 1<sup>st</sup> paragraph).

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3. Referring to claim 2, Grant reference discloses the pipelined network is synchronous in that boundaries of all the pipeline stages are aligned (Grant – col. 5, lines 62-65; col. 8, last paragraph through col. 9, 1<sup>st</sup> paragraph; and col. 10, lines 7-15).
4. Referring to claim 3, Grant reference disclose the pipeline stages include a transfer stage (Grant – service request phase) col. 5, lines 36-41), and an acknowledge stage (Grant – (release acknowledge phase) col. 5, lines 50-54), the stages being in a fixed time relation to each other (col. 5, last paragraph through col. 6, 1<sup>st</sup> paragraph).
5. Referring to claim 4, Grant reference discloses the pipeline stages having equal length (Grant – (synchronous: fixed interval) col. 5, lines 63-64).
6. Referring to claim 5, Grant reference discloses a check stage in which an initiator node checks if transmission of a sent packet was successful (Grant – col. 5, last paragraph through col. 6, 1<sup>st</sup> paragraph).
7. Referring to claim 8, Grant reference discloses during the transfer stage the packet supplied by the initiator traverses the network (Grant – col. 5, lines 22-49).
8. Referring to claim 9, Grant reference disclose during the acknowledge stage, an acknowledge packet is returned by the target node to the initiator node (col. 5, last paragraph through col. 6, 1<sup>st</sup> paragraph).
9. Referring to claim 10, Grant reference disclose the acknowledge packet is checked by the initiator during the check stage (col. 5, last paragraph through col. 6, 1<sup>st</sup> paragraph).
10. Referring to claim 11, Grant reference disclose the check stage is fixed in time in relation to the arbitration stage, thereby allowing the initiator node to check for successful completion of

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sending the packet a fixed time after the arbitration stage (Grant - col. 5, lines 42-49; and col. 6, lines 15-20).

11. Referring to claim 12, Grant reference discloses the transfer stage includes multiple pipeline stages to transmit the transfer packet across the network (Grant – lines 36-41).

12. Referring to claim 13, Grant reference discloses the acknowledge stage includes multiple stages to transmit the acknowledge packet across the network (Grant - col. 6, lines 15-20).

13. Referring to claim 14, Grant reference discloses the number of bytes transferred per request during the transfer stage is fixed (Grant – (synchronous: fixed interval) col. 5, lines 63-64).

14. Referring to claim 15, Grant reference discloses outstanding transactions across the pipelined network are delivered in order (Grant – col. 10, lines 30-37).

15. Referring to claim 16, Grant reference discloses a switch coupling the nodes on the pipelined network (Grant – col. 14, lines 20-25).

16. Referring to claim 31, Grant reference discloses a plurality of processing nodes, each processing node including at least one processor, and a synchronous pipelined switched network coupling the plurality of processing nodes, the pipelined network having a plurality of pipeline stages, the pipeline including at least an arbitration stage to obtain a path through the pipelined switched network (Grant – (path establish phase) col. 5, lines 42-49), a transfer stage transferring data over the path ((Grant – service request phase) col. 5, lines 36-41) and an acknowledge stage (Grant – (release acknowledge phase) col. 5, lines 50-54), each stage being of equal length (Grant – (synchronous: fixed interval)), (Grant – Abstract; col. 5, lines 25 through col. 6, lines 10; col. 13, lines 20-36; and col. 5, lines 63-64); wherein during the arbitration stage, arbitration

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logic communicates with a target node to determine if the target node can accept a packet from an initiator node (col. 10, last paragraph through col. 11, 1<sup>st</sup> paragraph).

17. Referring to claim 32, Grant reference discloses the pipelined switched network comprises a first switching circuit coupling the plurality of processing nodes, the first switching circuit carrying information transmitted during the transfer stage (Grant – col. 14, lines 21-25).

18. Referring to claim 35, Grant reference discloses the networked computer system further includes at least one storage node coupled to the plurality of processing nodes through the synchronous pipelined switched network (Grant – col. 9, lines 26-37).

19. Referring to claim 36, Grant reference discloses the networked computer system further includes at least an input/output node coupled to the plurality of processing nodes through the synchronous pipelined switched network (Grant – Abstract; Figures 1, and 2).

20. Referring to claims 37, Grant reference disclose transmitting information from an initiator node to a target node using a plurality of pipeline stages (Grant – col. 5, lines 34-35); requesting a path through the network from the initiator node to the target node during an individual one of the pipeline stages, and communicating with the target node during an individual one of the pipeline stages to determine if the target node can accept a packet from the initiator node (col. 5, lines 34-54; and col. 10 last paragraph through col. 11, 1<sup>st</sup> paragraph).

### ***Claim Rejections - 35 USC § 103***

21. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person



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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

22. Claims 17,33, and 34 rejected under 35 U.S.C. 103(a) as being unpatentable over Grant in view of Lam et al. U.S. Patent 6,553,027.

Grant reference discloses a switch coupling the nodes on the pipelined network; however, Grant reference fail to disclose network comprises a plurality of cascaded switches.

Lam reference disclose network comprises a plurality of cascaded switches (Lam – Figure 5).

It would have been obvious to one of the ordinary skill in the art at the time of the invention was made to incorporate to apply cascaded switches of Lam's teaching into Grant's system to effectively form a single network switch increased number of ports.

23. Referring to claim 33, Grant disclose the invention substantially as claimed as described above; however, Grant reference fail to disclose discloses the pipelined switched network comprises a second switching circuit coupling the processing nodes, the second switching circuit being independent of the first switching circuit and wherein at least a portion of pipeline operations are carried over the second switching circuit simultaneous with operations for the transfer stage carried over the first switching circuit

Lam reference disclose network comprises a plurality of cascaded switches in which the information for at least a portion of pipeline operations are carried over the second switching circuit simultaneously with operations for the transfer stage carried over the first switching circuit (Lam – Figures 5, and 6; Abstract; and col. 11, lines 49-55).

It would have been obvious to one of the ordinary skill in the art at the time of the

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invention was made to incorporate Lam's teaching into Grant's system to use the cascaded switches to transmit a portion of operations are carried over the second switching circuit to allows the transferred data between network switches to occur much faster than over a shared medium.

24. Referring to claim 34, Grant reference disclose a pipeline network with contain three phases is require to complete transfer from an originator nodes to a destination nodes. As previous explain claim 33 the pipeline operations are carried over the second switching circuit simultaneously with operations for the transfer stage carried over the first switching circuit. And due to the invention of Grant is pipelining; therefore, the information for the arbitration and acknowledge stages are also applied to the carried over operation between the first and second switching circuit, which allows the transferred data between network switches to occur much faster than over shared medium.

25. Claims 18,19,22,27, and 30 rejected under 35 U.S.C. 103(a) as being unpatentable over Grant in view of 31-36 rejected under 35 U.S.C. 103(a) as being unpatentable over Kumar U.S. Patent 6,122,274.

26. Referring to claim 18, Grant reference disclose transmitting the information from an initiator node to a target node using a plurality of pipeline stages in the computer network, each pipeline stage having a fixed forwarding delay (Grant - Abstract; col. 5, lines 36-47; and col.5, lines 62-65); and requesting a path through the network from the initiator node to the target node during an arbitration stage((Grant – service request phase) col. 5, lines 36-41) from arbitration logic, the arbitration logic communicating with the target node to determine if the target node can accept a packet from the initiator node (col. 10, last paragraph through col. 11, 1<sup>st</sup>

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paragraph); however, Grant reference fails to disclose that overlapping an operation in one pipeline stage with another operation in another pipeline stage.

Kumar reference discloses the overlapping an operation in one pipeline stage with another operation in another pipeline stage (Kumar – Figure 9, for example at pipeline cycle  $t=3$ , stage 1, 2, and 3 are overlapped each others).

It would have been obvious to one of the ordinary skill in the art at the time of the invention was made to incorporate overlapping feature of Kumar's teaching into Grant's method to use the overlapping technique to enhance parallelism as the pipeline stages fill up with multiple tasks, and hence a speed up in throughput is achieved by the disclosed switching method.

27. Referring to claim 19, Grant reference disclose sending at least one data packet containing the information from the initiator node to the target node during one or more transfer stages (Grant – service request phase), and sending an acknowledge packet containing status of receipt of the data packet from the target to the initiator during one or more acknowledge pipeline stages (Grant – release acknowledge phase) (Grant – col. 5, lines 33-54).

28. Referring to claim 22, Grant reference disclose the pipelined network includes a first switching circuit coupling the initiator node and the target node, the first switching circuit carrying information transmitted during the transfer stage (Grant – col. 14, lines 21-25).

29. Referring to claim 27, Grant reference discloses the initiator node checking the acknowledge packet a fixed number of pipeline stages after sending the transfer packet, to determine whether transmission of the information was successful (Grant - col. 5, lines 42-49; and col. 6, lines 15-20).

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30. Referring to claim 30, Grant reference disclose sending all information across the network in order (Grant – col. 10, lines 30-37)

31. Claims 23, and 24 rejected under 35 U.S.C. 103(a) as being unpatentable over Grant and Kumar as applied to claims 18,19, and 22 above, and further in view of Lam U.S. Patent 6,553,027.

32. Referring to claim 23, Grant and Kumar disclose the invention substantially as claimed as described; however, Grant and Kumar reference fail to disclose network includes a second switching circuit coupling the initiator node and the target node, the second switching circuit being independent of the first switching circuit and wherein information for at least a portion of pipeline operations are carried over the second switching circuit simultaneously with operations for the transfer stage carried over the first switching circuit.

Lam reference disclose network comprises a plurality of cascaded switches in which the information for at least a portion of pipeline operations are carried over the second switching circuit simultaneously with operations for the transfer stage carried over the first switching circuit (Lam – Figures 5, and 6; Abstract; and col. 11, lines 49-55).

It would have been obvious to one of the ordinary skill in the art at the time of the invention was made to incorporate Lam's teaching into Grant's and Kumar's system to use the cascaded switches to transmit a portion of operations are carried over the second switching circuit to allows the transferred data between network switches to occur much faster than over a shared medium.

33. Referring to claim 24, due to Grant reference discloses a pipeline network with contains three phases is requiring to complete transfer from an originator nodes to a destination nodes. As

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previous explain claim 23 the pipeline operations are carried over the second switching circuit simultaneously with operations for the transfer stage carried over the first switching circuit. And due to the invention of Grant is pipelining; therefore, the information for the arbitration and acknowledge stages are also applied to the carried over operation between the first and second switching circuit, which allows the transferred data between network switches to occur much faster than over shared medium.

#### ***Allowable Subject Matter***

6. Claims 7 and 28-29 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.
7. Claims 6, 20-21, and 25-26 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

#### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
  - a. U.S. Patent No. 6,161,160 to Niu et al. disclose a network interface device architecture for storing transmit and receive data in a random access buffer memory across independent clock domains.

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- b. U.S. Patent No. 5,367,643 to Chang et al. disclose a generic high bandwidth adapter having data packet memory configured in three level hierarchy for temporary storage of variable length data packets.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phuoc H. Nguyen whose telephone number is 571-272-3919. The examiner can normally be reached on Monday - Friday.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wiley can be reached on 571-272-3923. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Phuoc H Nguyen  
Examiner  
Art Unit 2143

August 3, 2005



**DAVID WILEY**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2100**